

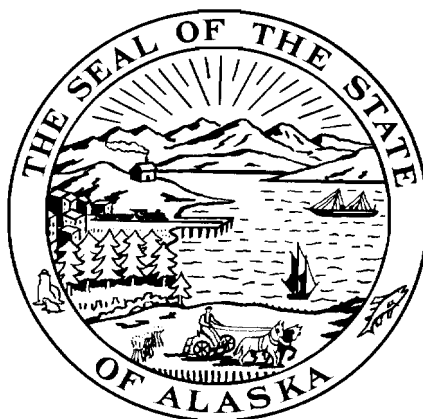
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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1965 - 1966

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-7

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME
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INTRODUCTION

This report of progress consists of Job Segment Reports conducted under the State of Alaska Federal Aid in Fish Restoration Project F-5-R-7, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 18 separate studies. Some are specific to certain areas, species or fisheries, while others deal with a common need for information. Each job has been developed to meet the needs of various aspects of the State's recreational fishery resource. Seven jobs are designed to pursue the cataloging and inventory of the numerous State waters. These jobs, which are of a continuing nature, will eventually index the potential recreational fisheries. Four jobs are directed toward specific sport fish studies. These include specialized efforts toward the anadromous Dolly Varden of Southeastern Alaska, the silver salmon in Resurrection Bay, the king salmon stocks on the Lower Kenai Peninsula, the king salmon stocks in Upper Cook Inlet, and the Arctic grayling of the Tanana River system.

The statewide access program is developing rapidly. Our efforts in investigating existing and potential recreational sites and access has resulted in favorable action being taken on our proposals and recommendations submitted to the land management agencies at both the State and Federal levels.

The remaining jobs included a specialized creel census effort in Southeastern, an egg-take program designed to establish indigenous egg-take sources, and evaluation of the Fire Lake system.

Three special reports have been completed from past studies on the Dolly Varden study. These appear in the Department's "Research Report" series and are a direct result of the Federal Aid In Fish Restoration Program. To date, the following reports have been published: Research Report No. 3, "Some Migratory Habits of the Anadromous Dolly Varden Salvelinus malma (Walbaum) in Southeastern Alaska," 1965, Robert H. Armstrong; Research Report No. 4, "Annotated Bibliography on the Dolly Varden Char," 1965, Robert H. Armstrong; and Research Report No. 5, "Age and Growth of Anadromous Dolly Varden Char Salvelinus malma (Walbaum), in Eva Creek, Baranof Island, Southeastern Alaska," 1966, David W. Heiser.

The material contained in this progress report is often fragmentary in nature. The findings may not be conclusive and the interpretations contained herein are subject to re-evaluation as the work progresses.

RESEARCH PROJECT SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska

Project No.: F-5-R-6 Title: Inventory, Cataloging and Population Sampling of the Sport Fish and Sport Fish Waters of the Cook Inlet Drainage.

Job No.: 11-A

Period Covered: January 1, 1965 to December 31, 1965.

ABSTRACT

Three lakes and two stream systems were cataloged during the investigation period. Good combined populations of lake trout, Salvelinus namaycush; lake whitefish, Coregonus clupeaformis; and round whitefish, Prosopium cylindraceum; were found in Deadman and Shell Lakes. Hewitt Lake contained high numbers of whitefish but no lake trout. A bisexual specimen of lake whitefish was found at Deadman Lake. The outlet stream of Deadman Lake contained an excellent population of grayling, Thymallus arcticus. The outlet of Shell Lake supports good numbers of rainbow trout, Salmo gairdneri.

Population sampling with experimental gill nets was conducted in eight stocked lakes. All stocked waters contained good populations of game fish. Best stocked lake catch returns were obtained at Long, Falk, and Bonnie Lakes.

A survey of Cottonwood Creek, Matanuska Valley, disclosed an estimated 4,300 square yards of useable spawning gravel for salmonoids. Total useable spawning gravel surveyed in the Wasilla Creek system was estimated at 3,720 square yards.

A weir was installed in Cottonwood Creek to enumerate the adult spawning escapement of silver salmon, Oncorhynchus kisutch, and red salmon, O. nerka. A modified Latin Square census technique was utilized to estimate the harvest of the salmon sport fishery. The silver salmon sport catch totalled 451, and the spawning escapement was 102. The red salmon sport catch was 468, and the escapement was 125. Fecundity studies showed an average egg count of 2,670 per female silver salmon.

Three lakes were chemically rehabilitated in September using 1.5 parts per million powdered rotenone. A post-evaluation study using baited minnow traps and sight observations indicated that complete eradication was achieved. After three weeks of live-car observations it appeared that six weeks after

treatment Kepler-Bradley Lake remained toxic. Tests were terminated by ice cover.¹

Best fishing success in unplanted waters was found at Long Lake for burbot, Lota lota, in the winter, and at Goose Creek, Little Willow Creek, Montana Creek, and Sheep Creek for grayling and rainbow trout during the summer. Salmon runs in the district were among the lowest in recent history.

Among the stocked waters, Finger and Echo Lakes produced excellent winter ice fisheries. Analysis of the summer fishery showed that Finger and Bonnie Lakes provided the highest sport catches.

Winter dissolved oxygen and pH tests disclosed that of 18 waters tested, 3 appeared marginal for survival of salmonoids.

Recommendations for the planting of stocked lakes are made.

Assistance was provided in obtaining public access to two lakes important for fishery management.

RECOMMENDATIONS

1. It is recommended that Triangle and Long Lakes be rehabilitated during 1966 so that game fish populations may be established. Both waters presently contain stickleback, but no game fish. Both are within five miles of Palmer and public access has been obtained.
2. The cataloging and inventory program should be continued to further the Department's knowledge of existing fisheries and their relative importance for public use sites.
3. Continued census and test netting of stocked waters is recommended so that guidelines may be established for future management techniques.

OBJECTIVES

To evaluate the extent, the potential and current use of the waters readily available to the area's anglers.

To investigate the sources for providing a supply of trout, char, and salmon eggs for experimental hatching and rearing.

To investigate the feasibility of, and formulate plans for experimental rehabilitation.

To investigate and measure the sport fish population trends in major recreational fishing waters that are readily available to the area's anglers.

To provide recommendations for the management of those waters.

¹ The rehabilitation portion of this study was conducted under Federal Aid Project F-8-D-4.

TECHNIQUES USED

Fish populations on both inventoried and stocked lakes were assessed with variable mesh, 125-foot gill nets fished overnight. The nets are set in the same locations in each stocked lake each year and only the hours between sunset and sunrise are used for population trend analyses. All fish lengths are fork length in inches and tenths of inches and all weights are in pounds and tenths of pounds.

A special study was instigated to determine the status of the silver salmon in Cottonwood Creek, a small but heavily fished local salmon stream. A temporary weir was placed immediately above the legal fishing area at the lower limit for effective spawning. The location allowed a total escapement count of silver and red salmon. A small sample of silver salmon was examined for length, weight, parasitism and fecundity. A Latin Square random sampling procedure was devised to assess the total sport fish harvest using creel census and car count data.

Three small, landlocked lakes near Palmer were chemically rehabilitated with 1.5 parts per million of powdered 7.7 percent rotenone for the removal of three-spined stickleback. The powder was distributed by towing the sacks behind outboard-powered skiffs. Shoreline and marsh areas were treated with liquid 5 percent synergized rotenone sprayed from a boat-operated power pump and from portable back-pack pumps. Test fish were introduced in live cars three weeks after treatment, and a record of mortality was kept in an effort to determine the rate of detoxification.

Creel census of district waters was designed to assess the rate of angler success, and the size and species composition of game fish taken. As salmon runs were low in 1965, the major summer census effort was shifted from the Susitna River tributaries to the Cottonwood Creek area.

A Hach colorimeter was used for dissolved oxygen and pH levels during the March-April water stagnation period. Accuracy of dissolved oxygen tests was checked by titration, and pH evaluations were checked with buffers.

FINDINGS

Cataloging and Inventory

Three lakes and two streams were surveyed for physical and biological characteristics (Table 1).

TABLE 1 - Matanuska Valley waters receiving basic surveys, 1965.

<u>Name</u>	<u>Type Ingress</u>	<u>Location</u>
Cottonwood Creek	Automobile	T16N, R2W, Sec. 1 SM*
Deadman Lake	Airplane	T36N, R7E, SM
Hewitt Lake	Airplane	T22N, R11W, SM
Shell Lake	Airplane	T22N, R12W, SM
Wasilla Creek	Automobile	T17N, R1E, Sec. 27 SM

* Seward Meridian

Surveys of additional waters were omitted due to budgetary limitations.

Test netting summaries for 11 lakes in the project area are presented in Table 2.

Complete records for waters investigated are maintained in the Palmer District Office, Anchorage Regional Office and the Juneau Headquarters Office.

Deadman Lake contained a high population of both lake and round whitefish along with fair numbers of small lake trout. Figure 1 shows a bisexual specimen of lake whitefish which was taken in the gill net at this lake. The outlet stream held an abundance of grayling. These fish averaged 13 inches in length and were easily taken by hook and line. Deadman is a high-country lake above timberline.

Hewitt and Shell Lakes are also large bodies, but they are located at a lower elevation and show infusions of rainbow trout and salmon. Shell Lake contains whitefish and lake trout populations, but small numbers of red salmon and rainbow are present. In addition, a large population of rainbow averaging 9.5 inches in length was present in the outlet stream.

Hewitt Lake lies within a few miles of Shell Lake, has similar physical characteristics, and contains good numbers of lake whitefish; no lake trout were found. Incidental numbers of rainbow and red salmon were present in the lake, but the muddy nature of the outlet stream precluded its use by fish for reasons other than a travel route.

Cottonwood Creek was investigated to learn the status of the silver salmon population. It was also possible to achieve a total or near total red salmon count since the runs of the two species overlap considerably.

The study was initiated July 15 and was terminated August 30. The employee lived in a house trailer at the weir in order to guard against vandalism, and to permit the release of salmon upstream from the trap box with a minimum of delay. The portable, wooden, weir-picket sections were braced in the stream by sharpened mallet-driven wood posts. The weir, when erected, spanned a total of 36 feet from bank to bank, with a V-trap box 3 feet wide, 6 feet long, and 3 feet deep placed in the main current at the east bank. The weir was removed at the termination of the study.

In addition to weir tending the employee was given a car-count schedule that had been prepared using a modified Latin Square random sampling technique. Weekend and weekday counts were treated separately; the sampling covered a full 24 hours daily since continual twilight permitted a constant fishery. Two counts were obtained in each 24-hour period, and as much creel census as possible at various hours was obtained. Data obtained from the census included number of anglers per party, hours fished, numbers, lengths and species of salmon taken. According to the car-count to anglers per party correlation, 563 fishermen, or 32.5% of the anglers engaged in the fishery were contacted. Results of the study are listed in Table 3.

The majority of legal, open sport fishing water in Cottonwood Creek is a two-mile tidal area entering Knik Arm. There is doubt as to whether all sport-caught salmon taken in the tidal stream mouth are Cottonwood Creek spawners. It is possible that a percentage of these fish which are



FIGURE 1. Bisexual Specimen of a Lake Whitefish from Deadman Lake.

TABLE 2 - Population Trend Study by Sampling Net, 1965.

Lake	Species**	No. in two-inch size groups								Average Length	Total Nets	Night Hrs/Net*	Frequency	Percent Composition
		6	8	10	12	14	16	18	19+					
Bonnie	RB	5	7	7	4		1		1	9.6	2	11.75	1.06	100.0
Deadman	LT			1	1		1	1	4	18.4	3	9.0	2.15	13.8
	GR		1							8.5				1.7
	WF	2	2	4	9	22	10			13.2				84.5
Echo	RB	4	2	5	25	7	2	1		11.6	2	11.50	2.00	100.0
Falk	RB	10						1	2	8.3	1	10.75	1.21	100.0
Finger	RB	1	2	1				1	2	12.7	2	11.50	1.30	23.3
	SS	1		1	7	11	3			12.9				76.7
Hewitt	RB				2	1		2	1	15.6	3	7.00	1.90	15.0
	WF			5	4	17	6			10.6				80.0
	RS	1							1	14.1				5.0
Irene	RB				2	1	2			13.3	1	11.25	0.44	100.0
Long	GR		7	23		1				9.4	2	12.25	1.27	100.0
(Mile 86)														
Ravine	RB	2	3	4	1	1				9.4	2	11.75	0.47	100.0
Shell	RB			1			1			13.0	2	6.75	0.81	18.2
	LT								4	22.7				36.4
	WF		1		1	2				11.9				36.4
	RS								1	22.4				9.0
Wiener	RB	16					1	1		6.8	2	12.25	0.90	81.8
	DV		3		1					9.2				18.2

* Sunset to sunrise hours only.

** RB - Rainbow Trout

SS - Silver Salmon

DV - Dolly Varden

GR - Grayling

RS - Red Salmon

LT - Lake Trout

WF - Whitefish

subject to the sport catch mill about in the area and subsequently enter other nearby streams.

TABLE 3 - Results of Cottonwood Creek Salmon Study, 1965.

<u>Species</u>	<u>Escapement</u>	<u>Sport Catch</u>	<u>Total</u>
Silver Salmon	102	451	553
Red Salmon	125	468	593
Estimated Spawning Capacity			1,075 pairs

Due to the low escapement in 1965 only six female silver salmon were taken for fecundity analysis. Average egg count per female was 2,670, average length was 21.7 inches, and average weight was 3.8 pounds. No parasitism was noted other than a light infestation of tapeworm in the small intestine of one fish.

The Cottonwood Creek system was surveyed by foot to estimate the total amount of gravel available to spawning salmon. A total of 4,300 square yards of spawning gravel was estimated. By allowing four square yards per pair of salmon the capacity of Cottonwood Creek is placed at 1,075 spawning pairs.

No source of pollution was noted. However, one partial barrier, an extensive beaver dam, was located.

Wasilla Creek was surveyed on foot and an assessment made of the total useable salmon spawning gravel. Available gravel in Wasilla Creek totaled 3,720 square yards. The system is estimated to be capable of supporting 930 pairs of salmon at four square yards per pair.

Lake Rehabilitation:

Rehabilitation of Canoe, Kepler-Bradley, and Gooding Lakes at a concentration of 1.5 parts per million powdered rotenone took place in mid-September. Surface water temperatures were 55°F. to 58°F., and weed growth was maximum.

Following treatment, the use of baited minnow traps and sight observations in spring areas failed to reveal the presence of live fish of any species. The study was limited to six weeks due to freezeup. Three weeks after treatment two live cars 18" high x 18" wide x 30" long were placed at depths of 5 and 15 feet in Canoe and Kepler-Bradley Lakes. One live box at the 5-foot level was deemed sufficient for Gooding Lake due to its shallow nature. Twenty hatchery rainbow running 400 to the pound were placed in each of the cages. The results of three weeks of tests, which were terminated by ice cover, are listed in Table 4.

TABLE 4 - Post-treatment Live-car Study of Three Matanuska Valley Lakes, 1965.

Lake	Surface Acreage	Rotenone Concentration PPM*	Percent Cumulative Live-Car Mortality		
			1 Week	2 Week	3 Week
Canoe	19	1.5	30	50	65
Gooding	57.9	1.5	10	15	20
Kepler-Bradley	58	1.5	25	70	95

* Parts per million

Creel census studies revealed that the highest success for sport-caught fish in stocked waters during 1965 was attained at Finger and Echo Lakes during the January-February-March ice fishery (Table 5). Although the rainbow trout fishery at Echo Lake was slightly better (1.76 fish per hour) than the silver salmon success at Finger Lake (1.60 fish per hour) it received light pressure while Finger Lake sustained the heaviest angling intensity of any local ice fishery in recent years. Many ice shanties were present, and most anglers were obtaining limit catches until the fish ceased striking readily in mid-March. Finger Lake produced the best fishing for the stocked lakes during the summer fishery with 0.76 fish per hour, closely followed by Bonnie Lake with 0.56 fish per hour (Table 6). A summary of pertinent test net and creel census data, valuable for year-to-year comparisons of the population status of the stocked lakes is found in Table 7. On the basis of cumulative data from Table 7 and past experience, recommendations for hatchery stocking combinations for Palmer district lakes are formulated (Table 8).

Highest angling returns for unstocked waters occurred during the February ice fishery at Long Lake, where 4.2 burbot per hour were taken (Table 5). Effort was light due to severe weather conditions. The summer fishery for native game fish was best at Goose Creek, with Little Willow, Montana and Sheep Creeks providing fair rainbow and grayling catches (Table 9). Cook Inlet silver salmon runs are strongest during even years, but they are normally fair during odd years. In 1965 catch rates were the lowest that local citizens could recall, and were almost nonexistent on Susitna tributary streams.

Dissolved oxygen and pH conditions existing in all stocked lakes and in waters having potential for future management are assessed on an annual basis (Table 10). All pH readings fall slightly on the acid side due to prevailing local soil conditions. The oxygen levels of Irene, Loon and Reedy Lakes appeared marginal for the survival of salmonoids.

TABLE 5 - Winter Sport Fishery Creel Census Results of Five Selected Lakes, Matanuska Valley, 1965.

Lake	Species	Number of Fish in Two-Inch Size Groups							Mean Length	Percent Composition	Total Anglers	Total Hours Fished	Fish/Angler	Fish/Hour
		6	8	10	12	14	16	18						
Big	DV			12	3		3		10.7	100.0	9	36	2.0	0.50
Echo	RB		1	63	26				10.6	100.0	17	51	5.3	1.76
Finger	RB					1	3	2	16.8	1.2	120	304	4.1	1.60
	SS	1	155	322	7				9.4	98.8				
Long (Mile 86)	Burbot				36	39			15.1	100.0	6	9	12.5	8.33
Wasilla	RB	5	4	1	2	1			9.4	100.0	7	12	1.9	1.10

TABLE 6 - Summer Creel Census Results of Five Selected Matanuska Valley Stocked Lakes, 1965.

Lake	Species	Number of Fish in Two-Inch Size Groups									Mean Length	Percent Composition	Total Anglers	Fish/Hour
		6	8	10	12	14	16	18	20	20+				
Bonnie	RB		5	18	5		1	1			10.4	100.0	17	0.56
Echo	RB	5	8	26	8			1			9.6	100.0	43	0.28
Finger	RB				4	1		5		2	15.9	14.5	77	0.76
	SS	12	44	13	2						8.3	85.5		
Ravine	RB		15		3	3					10.4	100.0	12	0.35
Wiener	RB			2	6	12	3				13.4	100.0	15	0.41

TABLE 7 - Cumulative Test Net and Creel Census Summary of Matanuska Valley Stocked Lakes, by Year.

<u>Lake</u>	<u>Year</u>	<u>Species</u>	<u>Average Length</u>		<u>Catch per Hour</u>	
			<u>Net</u>	<u>Angling</u>	<u>Net*</u>	<u>Angling</u>
Bonnie	1963	RB	11.3	9.9	2.00	0.89
	1964	RB	9.7	12.7	1.60	0.83
	1965	RB	9.6	10.4	0.85	0.56
Echo	1963	RB	10.0	12.8	1.60	0.10
	1964	RB	8.0	14.4	2.16	0.18
	1965	RB	11.6	9.6	1.43	0.28
Falk	1963	RB	8.8	10.2	0.88	
		SS	13.1	12.5	<u>0.12</u>	0.30
	1964	RB	14.2	12.7	<u>0.52</u>	0.27
	1965	RB	8.3	17.1	1.06	0.15
Finger	1963	RB	11.1		3.10	
	1964	RB	13.1	13.2	1.02	
		SS	8.0	8.0	<u>0.82</u>	0.33
	1965	RB	12.7	15.9	<u>0.27</u>	
		SS	12.9	8.3	<u>0.90</u>	0.76
Long (Mile 86)	1963	RB	22.5			
		GR	10.8		0.53	
	1964	GR	12.5	14.0	0.10	0.79
	1965	GR	9.4		1.32	
Ravine	1963	RB	9.3		1.10	
	1964	RB	10.7	11.5	0.16	0.37
	1965	RB	9.4	10.4	0.45	0.35
Wiener	1963	RB	8.2	8.3	1.94	
		DV	7.3	6.0	<u>0.20</u>	0.31
	1964	RB	11.3	10.5	<u>0.37</u>	1.19
	1965	RB	6.8	13.4	0.77	0.41
		DV	9.2		0.17	

* Sunset to sunrise hours only.

TABLE 8 - Hatchery Stocking Recommendations for Palmer Area Lakes, 1966.

A. Rainbow Trout

<u>Lake</u>	<u>Surface Acres</u>	<u>Remarks</u>	<u>Fish/Acre</u>	<u>Total No.</u>
Bonnie	123	Heavy Pressure.	200	24,600
Canoe	21	New lake, fair productivity, expect heavy pressure.*	400	8,400
Echo	23	High productivity, moderate to heavy use.	400	9,200
Falk	20	Low productivity, light to moderate use.	150	3,000
Finger	430	High productivity, heavy use. Most popular stocked lake in district.	250	107,500
Gooding	58	New lake, high productivity, expect moderate pressure.*	300	17,400
Irene	21	Fair productivity, expect moderate pressure.	200	4,200
Kepler-Bradley	60	New lake, fair productivity, expect heavy pressure.*	300	18,000
Meiers	16	Low productivity, light to moderate pressure.	150	2,400
Ravine	18	Fair productivity, expect moderate pressure.	150	2,700
Wiener	27	Large percentage of shoal area, but high elevation, fair productivity, expect heavy pressure as lake is beside main highway.	400	<u>10,800</u>
			TOTAL	208,200

B. Silver Salmon

Lucile	370	High productivity, expect heavy pressure.	250	92,500
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C. Grayling

Long (Mile 86)	237	Oligotrophic; rainbow plants have given little return. Expect moderate to heavy pressure. This will be grayling plant No. 2. First plant survived and grew very well.	200	47,400
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* Rehabilitated Lake.

TABLE 9 - Summer Creel Census Results of Matanuska Valley Unstocked Waters, 1965.

Water	Species	Number of Fish in Two-Inch Size Groups									Average Length	Percent Composition	Total Anglers	Fish/ Hour
		6	8	10	12	14	16	18	20	20+				
Caswell Creek	RB			1	1						10.8	20.0	34	0.33
	GR		2	4	1						8.5	70.0		
	WF		1								8.0	10.0		
Cottonwood Creek	SS							18	80	47	20.5	49.2	563	0.19
	RS							5	63	82	21.8	50.8		
Goose Creek	RB	1	5	3	3						9.5	40.0	15	1.30
	GR	3	14		1						8.0	60.0		
Little Willow Creek	RB	4	4	2	4	1	1				10.2	61.5	33	0.45
	GR		3	4	3						10.0	38.5		
Montana Creek	RB		1	9	15	3	1		1		12.0	35.7	133	0.45
	GR	4	11	21	9	2					10.5	56.0		
	DV				1			1			15.0	2.3		
	WF			1		2	2				14.5	6.0		
Sheep Creek	RB	1	7	13	5	6	2	4			11.0	49.4	131	0.44
	GR	3	4	7	3						9.6	22.0		
	DV	3	5	5	2	1					9.0	20.8		
	WF		2	2	1	1					10.3	7.8		
Willow Creek	RB	3		4	7	5	2				11.5	63.6	48	0.29
	GR			4	2	2	1				11.0	27.3		
	WF					1	2				14.6	9.1		

TABLE 10 - Lakes Tested for Dissolved Oxygen Content, 1965.

Name	Date	Location			Depth of:		O ₂ Sample		pH
		Township	Range	Section	Snow	Ice	Depth	PPM	
Canoe	3/22/65	17N	1E	13	0	36"	5'	3.1	6.4
							10'	1.4	
							20'	0.1	
Echo	3/23/65	17N	1E	24	0	28"	5'	4.7	7.2
							10'	4.2	
							20'	2.9	
Falk	3/22/65	17N	2E	16	0	24"	5'	5.7	6.8
							10'	4.2	
							15'	3.2	
Finger	3/23/65	17N	1E	33-34	0	36"	5'	7.0	6.6
							10'	6.0	
							20'	5.7	
Irene	3/22/65	17N	1E	13	0	35"	5'	2.0	6.5
							10'	1.3	
Kepler-Bradley	3/23/65	17N	1E	24	0	32"	5'	4.2	6.7
							10'	4.3	
Long (Kepler Area)	3/23/65	17N	1E	13-14	0	32"	5'	5.3	6.7
							10'	5.1	
Long (Mile 86)	4/5/65	20N	7E	20-21	2"	28"	5'	6.5	6.3
							10'	6.1	
							20'	4.8	
Loon	4/1/65	18N	3W	36	1"	22"	5'	2.2	6.2
							10'	1.4	

TABLE 10 (Cont.) - Lakes Tested for Dissolved Oxygen Content, 1965.

<u>Name</u>	<u>Date</u>	<u>Location</u>			<u>Depth of:</u>		<u>O₂ Sample</u>		<u>pH</u>
		<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Snow</u>	<u>Ice</u>	<u>Depth</u>	<u>PPM</u>	
Lower Bonnie	4/5/65	20N	6E	23	2"	34"	5'	7.2	6.2
							10'	6.5	
							20'	5.8	
Lucille	4/1/65	17N	1W	8	1"	30"	5'	6.7	6.6
							10'	1.7	
Meiers	3/26/65	17N	1E	18	0	28"	5'	9.1(E.	6.0
							10'	7.8 Side)	
							20'	7.3	
							5'	8.7(W.	
							10'	1.9 Side)	
							20'	0.5	
Memory	4/1/65	18N	1W	22	1"	28"	5'	4.7	6.1
							10'	5.3	
							20'	5.4	
Ravine	4/5/65	20N	6E	19	1"	41"	5'	5.0	6.7
							10'	5.2	
							20'	4.8	
Reedy	4/1/65	18N	1E	8	1"	34"	5'	2.1	6.2
							10'	0.4	
Rocky	4/2/65	17N	3W	16-21	1"	24"	5'	4.3	5.8
							10'	4.3	
							20'	2.1	
Triangle	3/23/65	17N	1E	14	0	32"	5'	2.5	6.2
							10'	0.5	
Wiener	4/5/65	20N	7E	22	2"	26"	5'	4.0	6.7
							10'	4.0	
							20'	3.8	

Public Access

A right-of-way walk-in easement document to two waters in the Palmer area, Long and Triangle Lakes, was obtained from the landowner with the aid of the access biologist. Minor complications for a public easement to Reedy Lake have been solved and appropriate documents may soon be signed.

Prepared By:

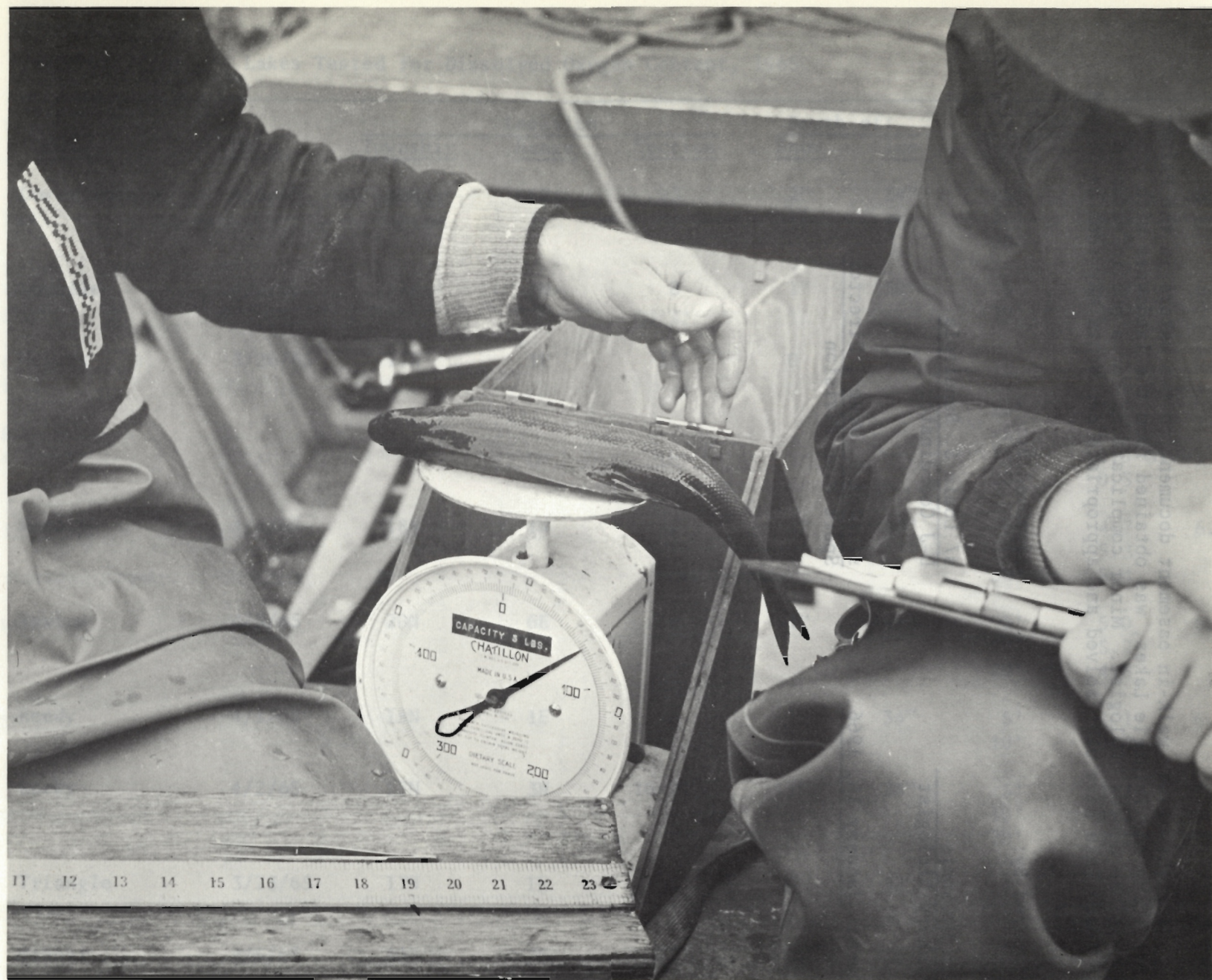
Approved By:

Dan McGinnis
Fishery Biologist

s/ Louis S. Bandirola
D-J Coordinator

Date: January 15, 1966

s/ Alex H. McRea, Director
Sport Fish Division



Grayling are Weighed and Measured to Determine Growth Rate and Population Characteristics.